Experiments to ascertain the Correction for Variations of Temperature, within the limits of the natural Temperature of the Climate of the South of England, of the Invariable Pendulum recently employed by British Observers. By Captain Edward Sabine, *of the Royal Artillery, Sec. R.S.* Read March 25, 1830. [*Phil. Trans.* 1830, *p.* 251.]

The correction for temperature which the author deduces as the general result of his investigation, is 0·44 of a vibration *per diem* for each degree of Fahrenheit between 30° and 60°. He considers this result as entitled to the greater confidence, from the favourable nature of the circumstances under which the inquiry was conducted; since the influence of natural temperature is more permanent and equable than that of temperatures artificially produced. He considers it as desirable, however, that means should be devised of extending experiments on this subject to a wider range of temperatures.

On a new Register-Pyrometer, for measuring the Expansions of Solids, and determining the higher Degrees of Temperature upon the common thermometric Scale. By J. Frederic Daniell, *Esq. F.R.S.* Read June 17, 1830. [*Phil. Trans.* 1830, *p.* 257.]

In the year 1821, the author published in the Journal of the Royal Institution an account of a new pyrometer, and of some determinations of high temperatures, in connexion with the scale of the mercurial thermometer, obtained by its means. The use of the instrument then described was, however, limited; and the author was subsequently led to the invention of a pyrometer of a more universal application, both to scientific researches and to various purposes of art. He introduces the subject by an account of the late attempt of M. Guyton de Morveau, to employ the expansions of platina for the admeasurement of high temperatures, and for connecting the indications of Wedgwood's pyrometer with the mercurial scale, and verifying its regularity. The experiments of that philosopher were by the contraction of porcelain, and by actual comparison with those of the platina pyrometer, at no higher temperature than the melting point of antimony; but they are sufficient to establish the existence of a great error in Wedgwood's original estimation of his degrees up to that point. This he carries on by calculation, on the hypothesis of uniform progression of expansion, up to the melting point of iron; the construction of his instrument not admitting of its application to higher temperatures than a red heat, in which platina becomes soft and ductile. Mr. Daniell shows, by an examination of M. Guyton's results, that he has failed in establishing the point he laboured to prove; namely, the regularity of the contraction of the clay pieces.

The pyrometer of the author consists of two distinct parts; the one designated the *register*, the other the *scale*.

The first is a square tube of black-lead, 8 inches long, cut out of a common crucible of that material, closed at one end, and having at the other a portion of about six tenths of an inch in length cut away